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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,078	06/29/2006	Kazuhiro Sugie	043888-0489	6192

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EXAMINER	
HAN, KWANG S	
ART UNIT	PAPER NUMBER
1727	

NOTIFICATION DATE	DELIVERY MODE
09/29/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mweipdocket@mwe.com

Office Action Summary	Application No.	Applicant(s)	
	10/585,078	SUGIE ET AL.	
	Examiner	Art Unit	
	Kwang Han	1727	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *8/23/11*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

5)☒ Claim(s) *1-6 and 8-16* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-6 and 8-16* is/are rejected.

8)☐ Claim(s) _____ is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

10)☒ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

12)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

LONG LIFE AND LOW CORROSION LEAD STORAGE BATTERY

Examiner: K. Han SN: 10/585,078 Art Unit: 1727 September 26, 2011

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on August 23, 2011 has been entered. Claim 7 was cancelled. Claims 1 and 10 were amended. Claims 15 and 16 were added.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: "LONG LIFE AND LOW CORROSION LEAD STORAGE BATTERY WITH A SEPARATOR INCLUDING SILICA AND OIL"

Claim Rejections - 35 USC § 103

4. The claim rejection under 35 U.S.C. 103(a) as unpatentable over Yonemura et al. in view of Ohba et al. and Haruno et al. on claims 1-6, 9, 11, and 13 are withdrawn, because independent claim 1 has been amended.

5. The claim rejection under 35 U.S.C. 103(a) as unpatentable over Yonemura et al. in view of Ohba et al. and Haruno et al. as applied to claims 1 and 2 and further in view of Doi et al. and Carlisle on claims 7 and 8 is withdrawn, because independent claim 1 has been amended and claim 7 has been cancelled.

6. The claim rejection under 35 U.S.C. 103(a) as unpatentable over Yonemura et al. in view of Ohba et al., Haruno et al., and Carlisle on claims 10, 12, and 14 are withdrawn, because independent claim 10 has been amended.

7. Claim 1-6, 9, 11, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yonemura (JP 2003-346888, machine translation) in view of Ohba et al. (US 5989750), Haruno et al. (JP 08-236101, machine translation), and Doi et al. (US 4210709).

Regarding claims 1 and 15, Yonemura is directed towards a lead storage battery [Abstract] comprised of the following:

- a plurality of negative electrode plates (Drawing 1) each with a negative electrode grid (6), having a handle part (5, tab), and a negative electrode active material [0014] retained by the grid,

- a plurality of positive electrode plates each with a positive electrode grid, having a handle part (tab), and a positive electrode active material retained by the grid [Abstract] (Drawing 1),
- a plurality of separators (3) separating the positive electrode plate and the negative electrode plate,
- a positive electrode connecting member (10, 8) comprising a positive electrode shelf (8, positive electrode strap) to which the handle part (tabs) of each positive electrode plate of the electrode plate pack is connected (Drawing 1),
- a positive electrode connecting body (10) provided at the positive electrode shelf,
- a negative electrode connecting member (7, 9) comprising a negative electrode strap (7) to which the handle part (tab) of each negative electrode plate of the electrode plate pack is connected (Drawing 1), and
- a negative electrode connecting body (9) provided at the negative electrode strap (Drawing 1) [0010-0020],
- the positive electrode grid, the negative electrode grid, the positive electrode connective member, and the negative electrode connecting member comprise a Pb-alloy including Ca or Sn [0012-0013], and
- a negative electrode active material layer including Sb [0006-0007].

Yonemura is silent towards the separator including silica and the electrode plate pack, positive electrode shelf, and the negative electrode shelf to be immersed in an electrolyte.

Ohba teaches a lead-acid battery separator which includes an acid-resisting, oxidation-resisting inorganic filler such as silica (3:9-30) for the benefit of forming a separator with high-rate discharge characteristics at low-temperature and endurance at a high temperature (2:41-44). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a separator with silica inorganic filler because Ohba teaches it forms a separator which has high-rate discharge characteristics at low-temperature and in endurance at a high temperature.

Haruno teaches a lead-acid battery in which an electrode group including the lugs and ledges of the plate formed from a Pb-Sn alloy is immersed in an electrolyte to assemble the battery and provide improved corrosion resistance at high temperature by continuously forming a Pb-Sn alloy layer [Abstract]. It would have been obvious to one of ordinary skill in the art at the time of the invention to immersed the electrode group structure formed from a Pb-Sn alloy in an electrolyte because Haruno teaches that it improves the corrosion resistance at high temperature by forming a Pb-Sn alloy layer.

Doi teaches a microporous film battery separator (13:39-42) formed from the combination of a polyolefin, an inorganic filler (silica; 7:37-47), and an organic liquid (8:47-55) where the void spaces are subjected to an impregnation with an organic substance or oil adhesion treatment (10:45-67) where the oil content is in a range from 5.2%, 9.8 wt%. or 14.9% to produce a film having excellent wettability and water

absorption (11:15-37; 12:9-26). The organic liquid includes various oils such as naphthenic process oil, lubricating oils, etc. (6:24-48). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a microporous film separator which is formed from a combination of polyolefin, inorganic filler such as silica, and an organic liquid because Doi teaches it forms a microporous film that can be used as a battery separator which has excellent wettability and water absorption.

Regarding claims 2 and 3, the teachings of Yonemura, Ohba, Haruno, and Doi as discussed above are herein incorporated. Ohba further teaches a separator comprising a microporous synthetic resin sheet (3:9-46) with examples having 65 wt % of silica particles (Column 5, Table 1, Sample No. 1) dispersed and a fiber mat (4:35-47) with examples having 30 wt % silica (Column 5, Table 1, Samples No. 3-5) dispersed. The compositional changes within the differing samples shown in tables 1 and 3 show that the composition including variations in silica content have an effect on the oxidation resistance teaching it as a result effective variable (column 5). The courts have held that optimization of a results effective variable such as the silica content is not novel. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claim 4, Yonemura discloses a negative electrode active material layer including 0.001 to 0.1 weight % of Sb [0006-0007]. It has been held that where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (MPEP 2144.05)

Regarding claim 5, Yonemura discloses the positive electrode lattice body having a lead alloy containing tin [0012].

Regarding claim 6, the teachings of Yonemura, Ohba, and Haruno as discussed above are herein incorporated. Yonemura and Haruno are silent as to the shape of the separator.

Ohba teaches the separator to be formed in a more reliable shape for holding the electrode such as an envelope (bag) to provide a greater sense of security (1:27-52; Claim 10). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a separator for a lead-acid battery with an envelope shape for the benefit of having a more reliable shape to hold the electrode. The courts have also held that the configuration of the claimed separator was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the separator was significant. In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Regarding claims 9 and 13, Yonemura discloses a negative electrode grid skeleton comprising an expanded mesh (Drawing 1) retaining the negative electrode active material layer [Abstract], a grid bone (frame, 4) provided at an upper edge portion of the expanded mesh and handle part (tab, 5) connected to the grid bone (frame) where the ratio of the height of handle part and the width of the grid bone is 2.2 to 15.0 (Drawing 1). The variation of the height in the handle part and width of the grid bone in the electrode grid would change the shape of the grid. The courts have held that the configuration of the claimed electrode grid was a matter of choice which a person of

ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the electrode grid was significant. In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Regarding claim 11, Yonemura discloses the lead or lead alloy to include no Sb or as an impurity [Abstract, 0012, 0014].

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yonemura, Ohba et al., Haruno et al., and Doi et al. as applied to claim 1 above, and further in view of Carlisle (US 3227583).

The teachings of Yonemura, Ohba, Haruno, and Doi as discussed above are herein incorporated. Yonemura, Ohba, Haruno, and Doi are silent as to the mass ratio of the negative electrode active material and the positive electrode active material.

Carlisle teaches a lead acid storage battery that is described to increase the capacity and performance capabilities of the battery by simply changing the ratio of the active positive material and the negative active material teaching it as a result effective variable (3:61- 4:17). It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the ratio of the positive and negative active materials since it has been held that discovering the optimum ranges for a result effective variable such as the ratio of the active materials involves only routine skill in the art in the absence of showing of criticality in the claimed range (MPEP 2144.05).

9. Claims 10, 12, 14, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yonemura (JP 2003-346888, machine translation) in view of Ohba et

al. (US 5989750), Haruno et al. (JP 08-236101, machine translation), Carlisle (US 3227583), and Doi et al. (US 4210709).

Regarding claims 10, 14 and 16, Yonemura is directed towards a lead storage battery [Abstract] comprised of the following:

- a plurality of negative electrode plates (Drawing 1) each with a negative electrode grid (6), having a handle part (5, tab), and a negative electrode active material [0014] retained by the grid,
- a plurality of positive electrode plates each with a positive electrode grid, having a handle part (tab), and a positive electrode active material retained by the grid [Abstract] (Drawing 1),
- a plurality of separators (3) separating the positive electrode plate and the negative electrode plate,
- a positive electrode connecting member (10, 8) comprising a positive electrode shelf (8, positive electrode strap) to which the handle part (tabs) of each positive electrode plate of the electrode plate pack is connected (Drawing 1),
- a positive electrode connecting body (10) provided at the positive electrode shelf,
- a negative electrode connecting member (7, 9) comprising a negative electrode strap (7) to which the handle part (tab) of each negative electrode plate of the electrode plate pack is connected (Drawing 1), and

- a negative electrode connecting body (9) provided at the negative electrode strap (Drawing 1) [0010-0020],
- the positive electrode grid, the negative electrode grid, the positive electrode connective member, and the negative electrode connecting member comprise a Pb-alloy including Ca or Sn [0012-0013], and
- a negative electrode active material layer including Sb [0006-0007].

Yonemura is silent towards the separator including silica and the electrode plate pack, positive electrode shelf, the negative electrode shelf to be immersed in an electrolyte, and the mass ratio of the negative electrode active material to the positive electrode active material.

Ohba teaches a lead-acid battery separator which includes an acid-resisting, oxidation-resisting inorganic filler such as silica (3:9-30) for the benefit of forming a separator with high-rate discharge characteristics at low-temperature and endurance at a high temperature (2:41-44). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a separator with silica inorganic filler because Ohba teaches it forms a separator which has high-rate discharge characteristics at low-temperature and in endurance at a high temperature.

Haruno teaches a lead-acid battery in which an electrode group including the lugs and ledges of the plate formed from a Pb-Sn alloy is immersed in an electrolyte to assemble the battery and provide improved corrosion resistance at high temperature by continuously forming a Pb-Sn alloy layer [Abstract]. It would have been obvious to one of ordinary skill in the art at the time of the invention to immersed the electrode group

structure formed from a Pb-Sn alloy in an electrolyte because Haruno teaches that it improves the corrosion resistance at high temperature by forming a Pb-Sn alloy layer.

Carlisle teaches a lead acid storage battery that is described to increase the capacity and performance capabilities of the battery by simply changing the ratio of the active positive material and the negative active material teaching it as a result effective variable (3:61- 4:17). It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the ratio of the positive and negative active materials since it has been held that discovering the optimum ranges for a result effective variable such as the ratio of the active materials involves only routine skill in the art in the absence of showing of criticality in the claimed range (MPEP 2144.05).

Doi teaches a microporous film battery separator (13:39-42) formed from the combination of a polyolefin, an inorganic filler (silica; 7:37-47), and an organic liquid (8:47-55) where the void spaces are subjected to an impregnation with an organic substance or oil adhesion treatment (10:45-67) where the oil content is in a range from 5.2%, 9.8 wt%. or 14.9% to produce a film having excellent wettability and water absorption (11:15-37; 12:9-26). The organic liquid includes various oils such as naphthenic process oil, lubricating oils, etc. (6:24-48). It would have been obvious to one of ordinary skill in the art at the time of the invention to use a microporous film separator which is formed from a combination of polyolefin, inorganic filler such as silica, and an organic liquid because Doi teaches it forms a microporous film that can be used as a battery separator which has excellent wettability and water absorption.

Regarding claim 12, Yonemura discloses the lead or lead alloy to include no Sb or as an impurity [Abstract, 0012, 0014].

Double Patenting

10. Claims 1-4, 6, and 10 provisionally rejected on the grounds of nonstatutory obviousness-type double patenting over claims 1-4 and 8 of copending application no. 10/587186 in view of Haruno et al. and Carlisle has been withdrawn in view of the Applicants amendments and arguments.

11. Claims 1 and 10 provisionally rejected on the grounds of nonstatutory obviousness-type double patenting over claim 1 of copending application no. 10/587187 in view of Ohba et al., Haruno et al. and Carlisle has been withdrawn in view of the Applicants amendments and arguments.

Response to Arguments

12. Applicant's arguments filed August 23, 2011 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

(a) the Doi reference doe not teach a separator with oil present.

In response to Applicant's arguments, please consider the following comments:

(a) as discussed in the grounds of rejection presented above the Doi reference clearly teaches the void spaces are further subjected to impregnation with an organic substance such as oil to produce the finished separator.

Contact/Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kwang Han whose telephone number is (571) 270-5264. The examiner can normally be reached on Monday through Friday 8:00am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on (571) 272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. H./
Examiner, Art Unit 1727

/Barbara L. Gilliam/
Supervisory Patent Examiner, Art Unit 1727